

What is claimed is:

1. A method of inserting an intraspinal implant from the lateral aspect of the human spine, comprising the steps of:
 - (a) making a penetration from the lateral aspect of a spinal disc intermediate two adjacent vertebrae;
 - (b) removing at least a portion of said spinal disc; and
 - (c) inserting through said penetration at least one implant between said adjacent vertebrae.
2. The method of claim 1 including the step of placing an extended outer sleeve at the lateral aspect of the spine.
3. The method of claim 2 in which said extended outer sleeve includes engagement means for engaging the spine.
4. The method of claim 3 in which said engagement means comprises penetrating means for penetrating at least one of said adjacent vertebrae.
5. The method of claim 3 in which said engaging means comprises at least one distal extension.
6. The method of claim 3 in which said extended outer sleeve comprises at least one extended member that is driven into said spinal disc from the lateral aspect of the spine in at least a partially side to side direction across said spinal disc.
7. The method of claim 3 in which said extended outer sleeve comprises distraction means for spacing apart said adjacent vertebrae.
8. The method of claim 3 in which said extended outer sleeve includes means for corrective realignment of said vertebrae adjacent said disc space.

9. The method of claim 3 in which the extended outer sleeve is dissociable into a proximal portion being furthest from the spine, and a distal portion being adjacent and oriented lateral to the spine; said extended outer sleeve being dissociated such that said proximal portion is removed and said distal portion is left in place for at least a portion of said method.

10. The method of claim 3 in which a portion of said extended outer sleeve protrudes outside the body of a patient for at least a portion of said method.

11. The method of claim 3 in which at least a part of said extended outer sleeve is tubular.

12. The method of claim 1 including the step of driving toward the lateral aspect of the spine an extended outer sleeve having a distraction means for distracting a disc space between two adjacent vertebrae and inserting the distraction means into said disc space.

13. The method of claim 3 including the step of inserting a drill into said extended outer sleeve and drilling a hole across a disc space between two adjacent vertebrae and into the two adjacent vertebrae.

14. The method of claim 3 in which hand held instruments are inserted through said extended outer sleeve to remove a portion of spinal disc material adjacent the spinal canal.

15. The method of claim 14 in which an endoscopic viewing device is passed down through said extended outer sleeve to observe said removal of a portion of spinal disc material.

16. The method of claim 3 including the step of inserting an implant through at least a portion of said extended outer sleeve and between the adjacent vertebrae.

17. The method of claim 1 in which said implant is oriented at least partially in a side to side direction across the adjacent vertebrae and occupies at least in part a portion of a space created by the removal of said portion of said spinal disc.

18. The method of claim 1 in which said implant engages at least in part a portion of each of said adjacent vertebrae.

19. The method of claim 1 in which said implant is inserted in at least a partial side to side direction across said adjacent vertebrae.

20. The method of claim 1 in which at least a portion of the step of removing said spinal disc is performed with a drill.

21. The method of claim 1 including the step of removing at least a portion of bone from at least one of said adjacent vertebrae.

22. The method of claim 21 in which at least a part of said step of removing a portion of bone is performed by drilling.

23. The method of claim 1 in which a drill is used to remove at least a portion of said spinal disc and at least a portion of bone from each of the adjacent vertebrae.

24. The method of claim 3 including the steps of inserting a drill through at least a portion of said extended outer sleeve from the lateral aspect of the spine, drilling at least a portion of said disc and at least a portion of bone from each of the adjacent vertebrae, and removing said drill.

25. The method of claim 24 including the step of removing any debris left in a space formed by the drilling following the removal of the drill.

26. The method of claim 1 in which a chisel is used to remove a portion of at least one of said adjacent vertebrae.

27. The method of claim 24 in which said drill passes through a hollow inner sleeve fitting at least in part around said drill, said inner sleeve having at least a portion thereof fitting within said extended outer sleeve.

28. The method of claim 3 including the step of inserting a hollow inner sleeve member into said extended outer sleeve.

29. The method of claim 28 in which said hollow inner sleeve member is removed from said extended outer sleeve prior to the step of inserting said implant.

30. The method of claim 28 including the steps of passing a drill through said hollow inner sleeve member, penetrating said spinal disc from the lateral aspect of the spine and penetrating across at least a part of said spinal disc in at least a partial side to side direction across said adjacent vertebrae.

31. The method of claim 1 including the step of engaging an alignment means to the spine from the lateral aspect of the spine.

32. The method of claim 31 in which said alignment means is a rod inserted from the lateral aspect of the spine into said spinal disc.

33. The method of claim 31 including the step of placing an extended outer sleeve over said alignment means.

34. The method of claim 31 in which said alignment means is at least in part hollow.

35. The method of claim 34 including the steps of inserting into

the lateral aspect of said spinal disc a guide pin having at least a portion extending laterally from said spinal disc, and placing said alignment means over said guide pin.

36. The method of claim 31 in which said alignment means is an intervertebral distractor that spaces apart the adjacent vertebrae.

37. The method of claim 36 in which at least a part of said distractor is hollow.

38. The method of claim 31 in which said alignment means has a distal end portion for insertion into said spinal disc, said distal end portion capable of distracting a disc space between two adjacent vertebrae and urging said adjacent vertebrae apart.

39. The method of claim 1 including the step of distracting apart said adjacent vertebrae.

40. The method of claim 1 including the steps of inserting a guide pin into a disc space between said adjacent vertebrae prior to the step of placing said extended outer sleeve; placing over the guide pin an alignment rod having a penetrating portion and a passageway for receiving the guide pin; and inserting said penetrating portion into said disc space.

41. The method of claim 1 including the step of inserting distraction means into a disc space between said adjacent vertebrae.

42. The method of claim 41 in which said distraction means comprises a first extension member for insertion in the disc space.

43. The method of claim 42 in which said distraction means includes a second extension member for insertion in the disc space.

44. The method of claim 28 including the step of inserting into the lateral aspect of a spinal disc a distractor having a penetrating portion prior to the step of inserting said extended outer sleeve.

45. The method of claim 1 including the step of inserting a guide pin toward the lateral aspect of the spine into the lateral aspect of said spinal disc in which at least a portion of said guide pin remains protruding from said spinal disc.

46. The method of claim 45 including the steps of placing over said guide pin a hollow distractor having a penetrating portion and a passageway for receiving the guide pin and inserting said penetrating portion into a disc space between said two adjacent vertebrae.

47. The method of claim 2 including the steps of making at least one incision along the lateral chest wall of a patient and driving said extended outer sleeve through said incision to the lateral aspect of the thoracic spine.

48. The method of claim 1 including the step of making at least one incision into the lateral aspect of the body of a patient for the purpose of accessing the lateral aspect of the spine.

49. The method of claim 1 in which said method is performed in the lumbar spine and includes the step of first approaching the lateral aspect of at least one spinal disc and at least a portion of the two vertebrae adjacent said disc by means of a retroperitoneal surgical dissection.

50. The method of claim 1 in which said method is performed from the lateral aspect of the spine and directed at least partially from side to side across said adjacent vertebrae.

51. The method of claim 3 in which said extended outer sleeve has portions penetrating into the spinal column, said portions extending from the distal end of said extended outer sleeve to penetrate said spinal column and are oriented in at least a partial side to side direction across said adjacent vertebrae.

52. The method of claim 1 including the step of tapping said adjacent vertebrae.

53. The method of claim 3 including the step of tapping said adjacent vertebrae.

54. The method of claim 53 in which said tap passes through at least a portion of said extended outer sleeve.

55. The method of claim 1 in which an endoscope is used during at least a portion of the method.

56. The method of claim 1 in which a radiographic imaging device is utilized during at least a portion of the method.

57. The method of claim 1 including the step of coupling a spinal fixation device to the spinal implant and engaging the spinal fixation device to the adjacent vertebrae.

58. A method of inserting an intraspinal implant from the lateral aspect of the spine, comprising the steps of:

- (a) making a penetration from the lateral aspect of a spinal disc intermediate two adjacent vertebrae;
- (b) firmly engaging the lateral aspect of the spine with a hollow tubular member;
- (c) removing at least a portion of said spinal disc through said hollow tubular member; and
- (d) inserting through said hollow tubular member at least one implant between said adjacent vertebrae.

59. A method of insertion an intraspinal implant from the lateral aspect of the spine, comprising the steps of:

driving toward the lateral aspect of a spinal disc intermediate two adjacent vertebrae an extended outer sleeve having engaging means for engaging the spine along its lateral aspect;

removing through at least a portion of said extended outer sleeve at least a portion of said spinal disc; and inserting into the lateral aspect of the spine at least one implant, said implant occupying at least in part the space created by the removal of said portion of spinal disc.

60. A method for inserting a spinal implant across two adjacent vertebrae in the spine from the lateral aspect of the spine using a distracting means to space apart said adjacent vertebrae; approach, comprising the steps of:

inserting from the lateral aspect of the spine an extended outer sleeve having engagement means for engaging the spine;

engaging said extended outer sleeve to the spine;

removing said distractor means;

removing at least a portion of a spinal disc intermediate said adjacent vertebrae;

inserting an implant through at least a portion of said extended outer sleeve into the disc space; and

removing the extended outer sleeve.

61. The method of claim 60 including the step of inserting an alignment means having a penetrating portion into the disc space;

62. The method of claim 60 in which said engagement means comprises a second distractor means for distracting the disc space between two adjacent vertebrae.

63. The method of claim 60 including the step of inserting an inner sleeve into the extended outer sleeve.

64. The method of claim 60 including the step of inserting a drill into the inner sleeve.

65. The method of claim 60 in which the step of removing said spinal disc includes drilling a hole across the disc space and into the two adjacent vertebrae.

66. The method of claim 60 in which said distractor means comprises an alignment means.

67. A distractor instrument for distracting the disc space between two adjacent vertebrae in the spine from the lateral aspect of the spine, comprising a penetrating portion for insertion in the disc space between two adjacent vertebrae, said penetrating portion having a length that is less than the transverse width of the vertebrae and greater than the anterior to posterior dimension of the vertebrae.

68. The distractor instrument of claim 67 in which said distractor instrument has a longitudinal passageway for receiving an alignment means.

69. The distractor instrument of claim 67 in which said distractor instrument comprises a barrel portion terminating in said penetrating portion, said barrel portion having a larger diameter than said penetrating portion.

70. The distractor instrument of claim 69 in which said distractor instrument includes a shoulder at the junction of said penetrating portion and said barrel member for preventing said barrel member from entering the disc space.

71. The distractor instrument of claim 67 in which said distractor instrument includes means for engaging an extraction instrument for removing said distractor instrument from within the disc space.

72. A surgical instrument comprising a hollow tubular member and an engagement means for engaging the lateral aspect of the spine.

73. The surgical instrument of claim 72 in which said engagement means comprises at least one extension member for insertion into a spinal disc intermediate two adjacent vertebrae along the lateral aspect of the spine, said extension member being oriented at least in part along the transverse width of the spine when said surgical instrument is engaged to the lateral aspect of the spine.

74. The surgical instrument of claim 73 in which said extension member extends at least in part transversely across the spinal disc within the anterior aspect of the spinal disc when said surgical instrument is engaged to the lateral aspect of the spine.

75. The surgical instrument of claim 74 in which said engagement means includes a second extension member extending at least in part transversely through the posterior aspect of said spinal disc when said surgical instrument is engaged to the lateral aspect of the spine.

76. The surgical instrument of claim 72 in which said engagement means comprises at least one penetrating member for penetrating at least one of two vertebrae adjacent a spinal disc.

77. The surgical instrument of claim 72 in which said instrument comprises at least two extension members.

78. The surgical instrument of claim 76 including a second penetrating member for penetrating the second of said two adjacent vertebrae adjacent a spinal disc.

79. The surgical instrument of claim 72 in which said engagement means for engaging the lateral aspect of the spine is positioned at the distal end of said hollow tubular member, said engagement means

being capable of centering said hollow tubular member with respect to the height of a spinal disc and the vertebrae adjacent said spinal disc from the lateral aspect of the spine.

80. The surgical instrument of claim 72 in which said hollow tubular member has a sufficient length to protrude from the lateral aspect of the human body when said surgical instrument is engaged to the lateral aspect of the spine.

81. The surgical instrument of claim 72 in which said hollow tubular member has a length which can be changed while said surgical instrument is engaged to the lateral aspect of the spine.

82. An extended outer sleeve for use in inserting a spinal implant into a hole formed across a disc space and into two adjacent vertebrae from the lateral aspect of the spine, comprising a hollow tubular member having at one end a distraction means for distracting and aligning the two adjacent vertebrae.

83. The extended outer sleeve of claim 82 in which said distraction means comprises a first extension member for insertion into the disc space.

84. The extended outer sleeve of claim 83 in which said distraction means includes a second extension member for insertion in the disc space.

85. The extended outer sleeve of claim 82 in which said first extension member is substantially in line with the exterior surface of said extended outer sleeve.

86. The extended outer sleeve of claim 82 in which said first extension member has a height that is substantially equal to the normal height of the disc space between two adjacent vertebrae.

87. The extended outer sleeve of claim 82 in which said first extension member comprises a tapered leading edge to facilitate insertion.

88. The extended outer sleeve of claim 82 in which said extended outer sleeve includes engagement means for engaging at least one of the two adjacent vertebrae.

89. The extended outer sleeve of claim 88 in which said engagement means comprises at least one penetrating member for penetrating the bone of at least one of the two adjacent vertebrae.

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90. A depth limiting device for a surgical instrument having a shaft and a grooved portion on said shaft, said surgical instrument being operated through a guide means having a passage way for receiving said shaft, comprising:

an adjustable collar for limiting the depth of said surgical instrument engaging said shaft, said collar having a diameter larger than the diameter of said shaft and larger than said passageway; and

a pair of diametrically opposed flange members pivotably mounted to said collar capable of engaging said grooved area, said flanged members being spring biased to engage said grooved portion when biased, and disengage said grooved portion when unbiased.

91. The method of claim 1 in which said implant occupies more than one half of the depth of the spinal disc, said depth measured from the anterior aspect to the posterior aspect of said spinal disc.

92. The method of claim 1 in which at least two implants are inserted.

93. The method of claims 92 in which said at least two implants have a combined width that is greater than one half the depth of said spinal disc, said depth being measured from the anterior

aspect to the posterior aspect of said spinal disc.

94. The method of claim 19 in which said implant has a width of at least 20 millimeters, said width being measured across the spinal disc from the anterior aspect to the posterior aspect of the spinal disc.

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